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AUTHOR Burts, Diane C.; And Others
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ABSTRACT

This preliminary study aimed to develop measures that could be used to differentiate kindergartens employing developmentally appropriate and inappropriate instructional practices, and explore the relationship between appropriate and inappropriate practices and stress behaviors of 37 kindergarten children. Four instruments were used to gather data: (1) a Teacher Beliefs Scale; (2) an Instructional Activities Scale; (3) a Checklist for Rating Developmentally Appropriate Practice in Kindergarten Classrooms; and (4) a Classroom Child Stress Behavior Instrument. The measures used were effective in identifying appropriate and inappropriate classes and measuring stress behaviors. With regard to the more substantive findings, results indicated that children in the developmentally inappropriate class exhibited significantly more stress behaviors than did children in the developmentally appropriate class. They also displayed higher frequencies of stress behaviors during whole group and workbook and worksheet activities. Children in the developmentally appropriate class had higher levels of stress during center time and transition activities, but spent much more time in center and transition activities than did children in the other class. Gender differences were also noted. (RH)

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A COMPARISON OF THE FREQUENCIES OF STRESS BEHAVIORS OBSERVED IN KINDERGARTEN CHILDREN IN CLASSROOMS WITH DEVELOPMENTALLY APPROPRIATE VS. DEVELOPMENTALLY INAPPROPRIATE INSTRUCTIONAL PRACTICES

Diane C. Burts and Craig H. Hart
School of Home Economics
Louisiana State University

Rosalind Charlesworth, Sue Hernandez,
Lisa Kirk, and Jean Mosley
College of Education
Louisiana State University

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Abstract

This research was a preliminary study designed to develop measures that could be used to identify developmentally appropriate and inappropriate kindergarten classrooms and to explore the relationship between appropriate/inappropriate practices and stress behaviors of 37 kindergarten children. The measures developed were found to be effective in identifying apropriate/inappropriate classrooms and measuring child stress behaviors. With regard to the more substantive findings, results indicated that children in the developmentally inappropriate classroom exhibited significantly more stress behaviors than children in the appropriate classroom. They also displayed higher frequencies of stress behaviors during whole group and workbook/worksheet avtivities. Children in the appropriate classroom had higher levels of stress during center and transition activities. Gender differences were also noted. Males exhibited more total stress behaviors than females.

Introduction

The research presented in this paper was a preliminary study developed as part of an ongoing longitudinal research project designed in response to two factors: (1) the increasing prevalence of developmentally inappropriate instructional practices being used with young children and (2) the belief that these inappropriate practices put pressures on young children resulting in stress which negatively affects growth and development. The long term goal of our research is to document whether inappropriate instructional practices are high stress relative to appropriate practices and to assess their long term effects. The purpose of the first phase of this research was twofold: (1) the development, refinement, and testing of the instrumentation needed to reach our goal and (2) to provide initial empirical data exploring the relationship between developmentally appropriate/inappropriate practices and stress behaviors in kindergarten children.

Literature Review

Developmentally Appropriate/Inappropriate Practice

In recent years there has been a significant increase in the use of more academically oriented paper and pencil activities in early childhood programs (Egertson, 1987; Hatch, 1988a, 1988b; Shepard & Smith, 1988). Nationally, there has been an outcry for an end to the use of these inappropriate objectives, activities, and instructional materials with young children (Bredekamp, 1987; Charlesworth, 1985; Elkind, 1986; Kamii, 1985; Williams & Kamii, 1986).

One of the most comprehensive documents (Bredekamp, 1987) addressing the issue of developmentally appropriate practice in early childhood programs is the position statement published by the National Association for the Education of Young Children (NAEYC). This document represents the expertise of many of the foremost authorities in the field and the experience of hundreds of early childhood educators.

In the document, the concept of developmentally appropriate practice is defined based upon knowledge of the typical development of children within a certain age span (age appropriateness) as well as the uniqueness of the individual (individual appropriateness). This is contrasted with inappropriate practice which ignores the concrete, hands-on approach to learning and emphasizes direct teaching of specific, discrete skills largely through abstract, paper and pencil activities often presented to large groups of children.

The NAEYC publication has inspired early childhood researchers to inquire into a number of questions relevant to appropriate and inappropriate practices (Caruso & Oakes, 1988; Charlesworth, Hart, Hernandez, Mosley, Kirk, & Burts, 1988; Hyson, 1988; Jensen & Chevalier, 1988). Many researchers believe the use of workbooks, ditto sheets, and highly structured, lock-step instruction based on inappropriate objectives is creating undue stress for young children, decreasing their chances of future success by not providing the necessary foundational experiences.

Stress

Today's young children are exposed to a multitide of stressors both in and outside the home (McCracken, 1986). Experts in early childhood education have issued warnings about the dangers of increased academic pressure on young children, resulting in increased stress symptoms

(Isenberg, 1987). Terms such as "hothousing" and "hurried" are being used to describe children enrolled in developmentally inappropriate programs due to their efforts to pressure children to acquire knowledge and skills earlier than they are developmentally able (Elkind, 1981; Hills, 1987; Sigel, 1987).

In recent reviews of the literature, both Honig (1986a, 1986b, & 1986c) and Swick (1987) pinpoint a multitude of potential stressors which may affect young children. Honig (1986a) suggests that adults can help young children by lowering environmental stress and by helping children learn to deal with stress when it does occur. Swick (1987) and Fogel (1982) state that the relationship between the child and the teacher at a personal level is critical.

Link Between Appropriate/Inappropriate Practices and Stress

The NAEYC (Bredekamp, 1986) inappropriate practices are congruent with those Swick identified as stress producers. These practices include almost exculsive use of teacher-directed highly structured large group lessons, paper and pencil tasks, rote learning, lack of opportunities to move about the room and make choices, teaching of isolated skills, over reliance on extrinsic reward systems, and use of standardized booklet assessment tests.

Appropriate practices appear to be the approach that would produce a low stress environment. A developmentally appropriate low stress classroom can contribute to maintaining the mental and the intellectual health of young children, since appropriate practices include providing experiences which meet the needs of individual children and promote self-esteem and positive feelings towards learning (Swick, 1987). The environment provides for active exploration and concrete experiences (Williams & Kamii, 1986). Positive guidance techniques are used, and children have opportunities to make choices.

There is also some evidence that developmentally appropriate programs have positive effects relative to student success in school and cost effectiveness for society (Lazar & Darling, 1982; Schweinhart & Weikart, 1985; Schweinhart, Weikart, & Larner, 1986). Some conclusions drawn from these studies have been subject to criticism, and thus must be viewed with caution (e.g., Bereiter, 1986; Gersten, 1986; Karweit, 1988).

Although much has been written concerning the negative effects of developmentally inappropriate curricula (e.g. Elkind, 1986; Gallagher & Coche', 1987; Isenberg, 1987; Schweinhart & Weikart, 1988; Shepard & Smith, 1988; Short, 1988; Sigel, 1987; Willert & Kamii, 1985), there is very little data to support the claims of its damaging effects. There is some evidence from the Schweinhart et al. (1986) report that at least one type of developmentally inappropriate curriculum may be damaging. Other evidence is mainly from informal observation and anecdotes of teachers and parents. Based on our anecdotal observations, it appears that children attending less developmentally appropriate kindergarten programs exhibit more stress-related behaviors in the classroom (e.g., fidgeting, lip biting, using disfluent speech) than do their counterparts in more developmentally appropriate programs.

Method

Subjects

In order to test our hypothesis, two teacher questionnaires were designed to assess the developmental appropriateness of teachers' beliefs

and practices. The measures were administered to 113 kindergarten teachers in four southern states. Based on results of analysis of the checklist for rating developmentally appropriate classrooms, two classes were selected representing developmentally appropriate and developmentally inappropriate kindergarten settings.

The resulting sample for the study consisted of 37 kindergarten children (5- to 6-year-olds). There were 17 subjects in the less developmentally appropriate classroom (8 males, 9 females) and 20 in the more developmentally appropriate classroom (10 males, 10 females). Children from the selected school were from lower and middle socioeconomic backgrounds.

Data Collection

Four instruments were used to gather data for the study. These included the: (1) Teacher Beliefs Scale and (2) Instructional Activities Scale designed to identify teachers using the most and least appropriate practices; (3) Checklist for Rating Developmentally Appropriate Practice in Kindergarten Classrooms designed to rate identified teacher's practices as to degree of appropriateness/ inappropriateness and to validate their questionnaire responses; and (4) Classroom Child Stress Behavior Instrument which defines child behaviors that are believed to indicate stress.

Measures

Teacher beliefs scale and instructional activities scale. These two measures were pilot tested on 113 kindergarten teachers in four southern states. Teachers were asked to rate 30 items representing 7 areas (e.g., curriculum goals, teaching strategies, integrated curriculum) on a 5-point likeart scale as to their percieved importance in the classroom. For instance, items such as: "Workbooks and/or ditto sheets are _____ to the kindergarten program" were accompanied by a 5-point scale with 1 as "Not Important At All" and 5 as "Extremely Important" with varying degrees of importance assigned to each number in between. To assess how often children participated in various classroom activities the Instructional Activities Scale was created. This measure was also comprised of 30 items and used a 5-point scale ranging from "Almost Never (less than monthly)" to Very Often (2-3 times daily)." Teachers were asked to rank each item such as: "Children selecting centers (home, book, math, science, writing, etc.)" and then to mark the scale accordingly.

Checklist for rating developmentally appropriate practice in kindergarten classrooms. A classroom teacher observation scale was also developed. This was an observational measure used to verify the teacher questionnaire findings for the two classrooms selected. This checklist consisted of 28 items reflective of items on the teacher questionnaires. Classroom observers marked a 5-point scale and rated each item as to whether instructional practices were more or less developmentally appropriate.

Classroom child stress behavior instrument. For the classroom observations of children's stress behaviors, observers were trained to use a scan sampling procedure (cf. Altmann, 1974) and stress coding scheme developed and field tested in kindergarten classrooms not involved in the study. Items selected for the observational scheme that reflected stress in children were derived from an extensive review of literature that documents manifestations of stress in child behaviors (e.g., Honig, 1986a, 1986b, 1986c; Rubin, 1984). The stress behavior instrument consisted of

two major stress categories (passive and active) and a nonstress category. The two major stress categories were divided into sub-categories (e.g., facial, self with self, self with others) which included some 50 child stress indicies (e.g., repetitive leg/arm movement, playing with/sucking hair).

The scan sampling procedure consisted of the observers scanning subjects in a predetermined random order for each of 10 days of observation. All classroom observations occurred at the same time during the morning hours of classroom instruction. For each subject, 85 scans were coded. During each two second scan, observers focused on the subject and coded his or her behavior into the nonstress category or into one of the sub-categories for stress behaviors described above. For each scan, the activity of the child was also recorded (e.g., whole group, center activity, workbook, testing).

To establish interrater reliability throughout the study, at the beginning of each day, two observers were assigned to one classroom where they conducted one cycle of observations of children within the class on a scan-by-scan basis. Agreement between observers was estimated with Cohen's kappa. The resulting coefficients fell within the range of .69-.95 with an overall average of .82.

Measures of children's stress behaviors were created by calculating the proportion of scans coded for the nonstress and for the passive, self with self, self with others, and self with object stress categories within each activity type (center, group, group-story, punishment, testing, transition, and workbook/worksheet). Proportions were created for each child by dividing the sum of the observatons in an activity type for the 10 day observational period in each classroom. Scores were also created for the activity types by summing the number of occurences of each activity type across the 85 scans.

Results

Results for Teacher Measures

Teacher beliefs scale. Examination of the psychometric properties of the Teacher Beliefs Scale yielded encouraging results. As can be seen in Table 1, item means ranged from 2.08 to 4.69 (average SD = .94). To assess the factorial validity of the measure, a principal factors analysis was conducted. This analysis produced four reliable factors with Eigen values greater than one accounting for 64% of item variance which, when rotated (varimax) to simple structure, yielded moderate to high item loadings (ranging from .40 to .80) on the designated factors and no substantial cross loadings.

Insert Table 1 about here

The designated factor descriptors for each of the four factors were: (1) developmentally appropriate (including items such as child selected activity, inventive spelling), (2) developmentally inappropriate (including such items as workbooks, flashcards), (3) positive teacher/child relationship (including items related to self-esteem, positive child/adult interaction), and (4) inappropirate literacy activities (including items such as standardized testing, forming letters on lines). Subscale reliability was assessed by Cronbach's alpha. Moderate levels of internal consistancy were obtained for items comprising these four factors (.85, .80, .68, and .74, respectively).

Instructional activities scale. Similar analyses were conducted for the Instructional Activities Scale. The principal factors analysis produced six factors accounting for 65% of the item variance which, after rotation, yielded item loadings (ranging from .35 to .86) on the designated factors and no substantial cross loadings (see Table 2). The designated factor descriptors for this measure were: (1) developmentallly appropriate, (2) developmentally inappropriate, (3) creative/explorative learning, (4) rote counting, (5) creative art, and (6) teacher directed learning/control. Low to moderate levels of internal consistency were obtained for items comprising these six factors (Cronbach's alpha ranging from .60 to .75).

Insert Table 2 about here

Classroom selection. For purposes of selecting classrooms and for further data analysis, composite (factor) scores were created by summing scores on variables that loaded on the same factor for each factor derived from prior analysis (see Tabachnick & Findell, 1983). These scores were then standardized to describe the relative position of each teacher on each factor within a distribution. Two classrooms in the same school were selected that were more and less developmentally appropriate based on teacher standardized scores falling a standard deviation above and below the mean on the developmentally inappropriate factor.

Checklist for rating developmentally appropraite practice in kindergarten classrooms. To verify the two classrooms represented more and less developmentally appropriate settings, independent ratings were made by four members of the research team who were blind to the results of the questionnaire. Observations were made in the two classrooms for four periods of 30 minutes each over a two-day period using the Checklist for Rating Developmentally Appropriate Practice in Kindergarten Classrooms. After all observations were completed, observers compared ratings, comfirming the results of the questionnaires.

Results for Stress Observations

Two sets of analyses were conducted to explore differences by classroom and by sex of child on the investigated measures of peer stress and activity type. The first set explored differences in child stress behaviors for each activity type and for all activity types combined. The second set assessed observed differences in instructional activities between the two classroom settings.

Multivariate analyses of variance (MANOVAS) were used to control for statistical dependencies among the dependent variables (stress scores and activity type) and to assess main and interactive effects of the independent variables (classroom and gender). The unbalanced method was used to control for unequal cell sizes. Where necessary, to control for the possibility of covariance between the means and variances of proportional data (Winer, 1971, p.399), arc-sine transformations were applied to the proportional scores prior to analysis. Post hoc tests (simple effects) were used to dismantle interactions and analyze mean differences.

Classroom differences in stress behaviors. Classroom differences in stress behaviors were examined with a 2(classroom) X 2(sex of child) MANOVA where proportional stress scores for each activity type served as variates. Findings for the stress measure produced a significant multivariate effect for classroom type $F(7,27) = 226.39$, $p < .001$ and a

marginally significant multivariate effect for sex $F(7,27) = 1.41$, $p < .06$.

A significant univariate effect was found for total stress scores indicative of stress behavior observed in all activity types combined, $F(1,33) = 127.03$, $p < .001$. Significant univariate effects were also obtained for center stress, $F(1,33) = 39.11$, $p < .001$; group time stress, $F(1,33) = 281.44$, $p < .001$; transition stress, $F(1,33) = 191.88$, $p < .001$; and workbook/worksheet stress, $F(1,33) = 446.52$, $p < .001$. No significant univariate results emerged for group story stress.

As the means in Table 3 indicate, significantly more total stress behaviors, and group time and workbook/worksheet stress behaviors were observed in the developmentally inappropriate classroom compared to the more appropriate classroom. In addition, more transition stress and center time stress behaviors were observed in the more appropriate classroom in comparison to the developmentally inappropriate classroom. For the sample as a whole, boys exhibited more stress behaviors than girls ($M = .56$, $SD = .15$, $M = .50$, $SD = .16$, respectively).

Insert Table 3 about here

Classroom differences in activity types. Differences in activity types for the two classroom settings were examined with a 2(classroom) X 2(sex of child) MANOVA in which scores derived for the activity types were used as variates. A significant classroom effect was obtained in the overall MANOVA, using Wilk's lambda as the criterion, $F(7,27) = 114.29$, $p < .001$, and in subsequent univariate analyses performed on activity measures of center, $F(1,33) = 376.78$, $p < .001$; group, $F(1,33) = 177.84$, $p < .001$; group story, $F(1,33) = 22.73$, $p < .001$; transition, $F(1,33) = 240.54$, $p < .001$; and workbook/worksheet, $F(1,33) = 273.67$, $p < .001$. Mean differences indicate that the more developmentally appropriate classroom had significantly more observed child selected center time, group story, transitions, and less large group and workbook/worksheet activities compared to the less developmentally appropriate classroom (see Table 4). Small, but approximately equal amounts of testing were observed in both settings over the 10 days of observations as all children were required to take a criterion referenced test during part of the observation period.

Insert Table 4 about here

Discussion

This research was a preliminary study designed to develop measures to identify developmentally appropriate and inappropriate kindergarten classrooms and to use these measures to explore the relationship between appropriate/inappropriate practices and stress behaviors. Results indicated differences in the number of stress behaviors exhibited by children in more and less developmentally appropriate kindergarten classrooms. Sex and activity type differences were also noted.

Caution should be exercised in interpreting the findings due to the limitations of sample size and location of the research (only one school used). Furthermore, subjects rather than classroom were the unit of analysis. Yet, the results suggest interesting relationships which have important implications for planning curricula for early childhood

programs.

Subjects in the more developmentally inappropriate classroom exhibited significantly higher levels of stress behaviors than children in the more developmentally appropriate classroom. Children displayed more stress behaviors during whole group and workbook/worksheet activities in the more inappropriate classroom than children in the more appropriate classroom. These findings provide empirical data to support the position of Elkind (1986), Schweinhart and Weikart (1988), Gallagher and Coche' (1987), Shepard and Smith (1988) and others who have warned of the negative consequences of inappropriate practices. It also suggests a link between inappropriate practices and stress as hypothesized by the current researchers. Since children today experience much stress in their lives, additional stress from an inappropriate curriculum may leave children even more vulnurable and unable to cope effectively.

A rather unexpected finding was that children in the developmentally appropriate classroom exhibited more stress behaviors during center time and transition activities than children in the more inappropriate classroom. To help explain these findings, it may be helpful to note the frequencies of these activities in each classroom as well as the anecdotal observations by the researchers.

The length of center time participation was much greater in the appropriate classroom than in the inappropriate classroom as indicated by the teachers' daily schedules (45 minutes-appropriate; 25 minutes-inappropriate), observed times (average 40 minutes-appropriate; 20 minutes-inappropriate) and confirmed in the analysis of frequencies for classroom activities (see Table 4). In addition, during much of the center time observed, the teacher was testing individual children and was not able to move around the room and interact with children in centers as was normally the case. Children were still free to select the center activity and the length of time they would stay in that center. Although they were not directed to do so, the children tended to stay at the first center they selected for most of the center time. The observers noted that there were few stress behaviors during the first part of center activity, and it was only during the last 10-15 minutes that stress behaviors occurred to any extent. Perhaps this was due to the fact that the teacher was not available to provide the guidance and direction needed to keep the activity from deteriorating and becoming stressful.

In the more developmentally inappropriate classroom, only four or five children were allowed in centers at a time while the majority of the class was in large group, teacher-directed instruction or working on workbook/worksheet activities. The length of center time was comparatively brief, and perhaps it was not long enough for their play to deteriorate and signs of stress to appear. Future studies need to look carefully at the length of time children are in an activity and how it affects the stressfulness of the activity.

Analyses also revealed gender differences. Males exhibited more total stress behaviors than females. These findings are supported by the literature which indicates that male children are more vulnerable to stress than female children and that certain stressors may affect boys and girls differently (Honig, 1986c).

Differences were also found between the two classrooms in time devoted to various activities. In the more appropriate classroom, there were significantly more center, group story, and transition activities while in the inappropriate classroom, there were more whole group and workbook/worksheet activities. These findings are what one would expect

based upon the NAEYC guidelines (Bredekamp, 1987) and help confirm the validity of the teacher questionnaires and the classroom observation scale in identifying appropriate and inappropriate classrooms. The guidelines describe an inappropriate classroom as one where instructional strategies revolve around teacher-directed, whole group activities paper and pencil tasks such as workbooks and worksheets, and transitions which tend to fragment the day with little attempt by the adult to coordinate smooth transitions. This is contrasted with a developmentally appropriate program which provides learning opportunities through child-initiated center activities, daily reading of books by the teacher, and a minimum number of whole group transitions where children are assisted in making smooth transitions throughout the day.

One might then wonder why there were significantly more transition times in the appropriate classroom as compared to the inappropriate classroom. Anecdotal observations by the researchers along with data on frequencies of activity types indicate that in the inappropriate classroom, children spent large blocks of time seated in whole group and workbook/worksheet activities. In the appropriate classroom, children spent much more time in center activity where they could move freely from one activity to another. The researchers failed to separately code the individual transitions (such as might occur in center activities) and the whole group transitions which could have precluded a clear interpretation of the findings. Since transition activity showed up as a significant variable in several of the analyses, future studies need to document the type of transition (individual, small group, whole group) and look carefully at what is occurring during this time.

Although this research was a preliminary study and the results must therefore be viewed with some caution, the groundwork has been laid through development of instrumentation which appears to be effective in identifying appropriate and inappropriate classrooms and child stress behaviors. However, to establish the integrity and validity of the subscales on the Teacher Beliefs Scale and the Instructional Activities Scale, further psychometric work using larger samples is needed.

The establishment of useful procedures for identifying stress behavior in young children has also been accomplished. In addition, this study has provided data in an area where there has been much speculation but little empirical evidence. Initial support has been obtained documenting that developmentally inappropriate educational programs (which emphasize the use of workbooks, ditto sheets, and highly structured lock-step activities) are potentially harmful to young children. Such a program produced significantly more stress behaviors in kindergarten children than did a more developmentally appropriate program.

Since today's young children are exposed to a multitude of stressors outside the school setting, additional stress produced in the classroom may have serious consequences. Findings from the current study suggest that curricula should be planned to provide a setting which is developmentally appropriate. Additional research is needed to further validate the findings from this study and to determine the long range effects of inappropriate practices on the development of young children.

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TABLE 1

FACTOR STRUCTURE[a], EIGEN VALUES, CRONBACH'S ALPHA, MEANS, AND STANDARD DEVIATIONS FOR THE TEACHER BELIEFS SCALE

	Appropriate I	Inappropriate II	Relationship III	Literacy IV	Item X	Item SD
I. Developmentally Appropriate:						
25 (Child dictates story)	.69				3.99	.88
29 (Inventive spelling)	.67				3.34	1.09
27 (Dramatic play)	.60				4.23	.78
7 (Individual interests)	.57				4.36	.72
26 (Functional print)	.50				3.88	1.03
8 (Developmental differences)	.44				4.57	.62
12 (Active exploration)	.44				4.69	.50
10 (Child sel. of activities)	.45				4.19	.76
11 (Active plan/participation)	.44				4.25	.80
3 (Eval. by observation)	.40				4.70	.56
30 (Social skills)	.41				4.65	.54
II. Developmentally Inappropriate						
14 (Workbook)		.79			3.10	.97
4 (Eval. by workbooks)		.67			3.12	.95
21 (Alphabet)		.58			4.06	.96
15 (Flashcards)		.56			3.21	1.20
19 (Punishment)		.54			3.09	1.16
16 (Whole group activity)		.53			2.82	.94
20 (Reasons for rules)		-.30			4.57	.65

Table 1 continued

	Item					
	Appropriate I	Inappropriate II	Relationship III	Literacy IV	X	SD
III. Positive Teacher/Child Relation						
28 (Child/adult interaction)			.62		4.36	.75
17 Teacher as facilitator)			.59		3.73	.49
9 (Self esteem)			.47		4.83	.40
24 (Reading stories)			.38		4.77	.49
IV. Inappropriate Literacy Activities						
23 (Letters on lines)				.69	2.69	1.04
22 (Color in lines)				.64	2.57	.93
2 (Standardized tests)				.48	2.25	.96
31 (Kindergarten reading emphasis)				.41	2.38	1.06
EIGEN VALUE	6.05	3.28	1.08	1.00		
CRONBACH'S ALPHA	.85	.80	.68	.74		

[a]Loadings less than .30 have been omitted for the sake of clarity.

TABLE 2

FACTOR STRUCTURE[a], EIGEN VALUES, CRONBACH'S ALPHA, MEANS, AND STANDARD DEVIATIONS FOR THE INSTRUCTIONAL ACTIVITIES SCALE

	A I	I II	Exploration III	Rote IV	Art V	Control VI	Item X	Item SD
I. Developmentally Appropriate:								
39 (Games and puzzles)	.72						4.84	.44
47 (Manipulatives)	.61						4.79	.64
35 (Center Selection)	.59						4.57	.91
34 (Building)	.55						4.67	.81
59 (Child coordin. act.)	.47						4.25	1.07
57 (Waiting 5 min.)	-.35						2.05	1.22
II. Developmentally Inappropriate								
55 (Chalkboard)		.75					2.26	1.45
53 (Write on lines)		.66					3.48	1.48
49 (Reading groups)		.58					3.05	1.77
51 (Flashcards)		.52					2.83	1.61
III. Creative/Exploratory Learning								
42 (Music)			.73				4.81	.48
38 (Creative writing)			.57				3.25	1.30
45 (Creative mmt.)			.52				3.92	1.14
41 (Exploring)			.38				3.12	1.23
37 (Records)			.38				4.80	.45
IV. Rote Counting								
54 (Rote alphabet)				.81			3.11	1.49
52 (Rote counting)				.52			3.94	1.26
48 (Predrawn)				.30			4.03	1.13

Table 2 continued

	A I	I II	Exploration III	Rote IV	Art V	Control VI	X	SD
V. Creative Art								
43 (Art)					.86		4.61	.71
46 (Free cutting)					.42		3.97	.93
VI. Teacher Directed Learning/Control								
56 (Sitting 15 min)						.69	3.65	1.43
58 (Large groups)						.55	4.67	.85
50 (Worksheets)						.39	4.38	1.12
61 (Losing privileges)						.37	3.49	1.41
EIGEN VALUE	4.71	2.93	1.68	1.17	1.09	1.05		
CRONBACH'S ALPHA	.63	.75	.66	.60	.65	.60		

[a]Loadings less than .30 have been omitted for the sake of clarity.

A = Appropriate I = Inappropriate

TABLE 3

MEANS AND STANDARD DEVIATIONS FOR CLASSROOMS
ON MEASURES OF STRESS WITHIN ACTIVITY TYPE

Activity type/Stress	Appropriate	Inappropriate
Center Stress		
M	.10*	.03
SD	.03	.03
Whole Group Stress		
M	.14	.31*
SD	.03	.03
Group Story Stress		
M	.03	.04
SD	.02	.03
Punishment Stress		
M	.01	.00
SD	.02	.00
Transition Stress		
M	.08*	.01
SD	.03	.01
Workbook/Worksheet Stress		
M	.02	.26*
SD	.02	.03
Testing Stress		
M	.01	.01
SD	.01	.02
Total Stress Scores		
M	.39	.66*
SD	.07	.08

*$p < .001$.

TABLE 4

MEANS AND STANDARD DEVIATIONS FOR CLASSROOMS ON FREQUENCIES OF ACTIVITY TYPES

Activity	Appropriate	Inappropriate
Center		
M	29.06*	9.70
SD	1.98	3.70
Whole Group		
M	22.88	36.70*
SD	3.22	3.28
Group Story		
M	11.06*	7.90
SD	2.25	1.65
Punishment		
M	1.88	.10
SD	2.78	.31
Transition		
M	16.18*	2.10
SD	2.90	1.55
Workbook/worksheet		
M	2.59	26.25*
SD	1.82	5.50
Testing		
M	1.41	1.25
SD	2.43	.64

*$p < .001$.